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(1-24).

THIRD REPORT

OF THE

VICTORIA-CAVE EXPLORATION COMMITTEE

(1875).

DRAWN UP BY

R. H. TIDDEMAN, M.A., F.G.S.

[*From the* REPORT *of the* BRITISH ASSOCIATION *for the* ADVANCEMENT *of* SCIENCE *for* 1875.]

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1876.

Third Report of the Committee, consisting of Sir John Lubbock, *Bart.*, Prof. Prestwich, Prof. T. M'K. Hughes, Prof. W. Boyd Dawkins, Rev. H. W. Crosskey, Messrs. L. C. Miall *and* R. H. Tiddeman, *appointed for the purpose of assisting in the Exploration of the Settle Caves* (*Victoria Cave*). *Drawn up by* R. H. Tiddeman, *Reporter*.

[Plates V. & VI.]

Work was carried on almost uninterruptedly throughout the year, except from March 20th to May 20th, when it was stopped for want of funds. An appeal to the public was made by the Settle Committee, and at the end of two months they considered themselves justified in recommencing work.

It is a matter of much interest to the Committee that the last subscription received (on Jan. 10th, previous to stopping the work for want of funds) was from the late Sir Charles Lyell, and unsolicited. Sir Charles had taken a deep personal interest in the explorations from their commencement, had visited the Cave, and been a frequent subscriber to the fund.

The Glacial Beds.—It will be remembered that in the last Report at Belfast we drew attention to the evidence respecting the pre- or interglacial age of the lower deposits in the Victoria Cave, which contain the early Pleistocene fauna associated with a human fibula. Since that time further evidence in this direction has been obtained. The great mass of boulders which lies upon the edges of the Lower Cave-earth at the entrance and beneath all the screes or talus has been further followed; and the facts brought to light are very interesting, and throw much light upon the origin and deposition of the glacial beds.

The boulders have now been uncovered over an area of about 30×40 feet or 1200 superficial feet (see Plates V. & VI. and descriptions), and probably extend beneath the screes over a still greater area. As before, the boulders are of all sizes and of various origin. Of the limestone boulders a large proportion are of blue or black limestone, and not of the white limestone in which the cave is excavated. They probably come from the top of the Carboniferous Limestone, which is widely exposed in the country to the north around the foot of Penyghent. One large boulder, on the other hand, an easily recog

nizable rock, consists of a portion of the *base* of the Carboniferous Limestone, which is a conglomerate of Silurian pebbles in a matrix of limestone, and must have travelled at least two miles to its present position. Other boulders consist of Carboniferous Sandstone or Millstone-grit, but a very large proportion are of Silurian rocks.

In size they run from large blocks several tons in weight to mere sand-grains, for the passage may be easily observed. At one place you have large boulders in a matrix of stony clay, then a clayey gravel, the component stones well scratched and bruised as only glacial deposits are, then fine gravel, still of the same character, shading off into sand. The sand again gives place to laminated clay of the finest character.

A very interesting section showing this has been lately uncovered; it lies at the back of the boulders, and contains several beds of laminated clay, sand, and gravel intercalated with indisputable glacial deposits.

This may be regarded as a positive proof that some at least of the laminated clay is of glacial age and origin.

In removing some of the boulders at the entrance, a step which the progress of the work necessitated, we appear at length to have come upon the solid floor of the cave-mouth. We found several long, wedge-like masses of rock, with their apices upwards, sticking up from amongst the boulders. They seem to run along definite lines, the spaces between which coincide with the vertical joints traversing the roof and side of the cave.

They stand up in pinnacles, and are not unlike in form similarly weathered floors in other caves in Craven. We may mention Browgill Cave near Horton in Ribblesdale, which is now occupied by a stream. This peculiar form seems to have arisen from the water working down along the joints and slowly dissolving the limestone, leaving an edge projecting upwards, in some cases almost as sharp as a knife. That the Victoria Cave was once a stream-course there can be no doubt; not only these limestone pinnacles, but the peculiar weathering of the side of the cave at the entrance into a succession of arched niches corresponding with the joints (another characteristic of water caves) render this tolerably certain (see Plates V. & VI. and descriptions).

And now, with the additional evidence of another year's diggings, we may again consider the question (the most interesting perhaps of all the problems before us)—Are the glacial deposits, which rest upon the older bone-beds containing the extinct pleistocene mammals and man, in the position which they occupied at the close of glacial conditions, or have they subsequently fallen into their present site?

We may again urge the reasons given last year, strengthened by enlarged sections and a wider experience, which go to prove the first alternative.

1. The cliff immediately above the cave is free from any boulder deposits for a considerable distance.
2. The boulders lie at the base of all the talus, which must have been forming ever since glacial conditions declined, and no other falls of even isolated boulders have occurred throughout the whole thickness of talus.
3. The boulders are so close beneath the cliff, that if all the limestone which has fallen from it and is now lying on the boulders could be restored to the cliff, it would project so much further forward, that the fall of the boulders from the cliff to their present position would be impossible.

To these arguments we may now add the following:—

4. That the extent of the glacial deposits now exposed is so great that it is impossible that they can be a mere chance accumulation of boulders which have been redeposited in their present position since glacial times.

This being the case, it is clear from the position of the boulders beneath all the screes that they form a portion of the general glacial covering of the valleys and hillsides which was left by the ice-sheet at the time of its disappearance.

These are the main arguments to be derived from the cave itself; but further strong presumptive evidence that the Pleistocene fauna lived in the north of England before the ice-sheet exists as follows:—

The older fauna once lived in that district, a point which admits of no dispute from its existence in the Victoria Cave, in Kirkdale Cave, Raygill Cave in Lothersdale, and perhaps in other caves; but their bones are now found nowhere in the open country. None of the river-gravels contain them; and just that district which is conspicuous by their absence is also remarkable for the strongest evidences of great glaciation. If these facts be taken together, the probability is very strong that it was glaciation which destroyed their remains in the open country.

To suppose that they have been destroyed by other subaerial agencies would be to ignore the fact that in the south of England and other non-glaciated areas such remains exist both in caves and in river-gravels. This view your Reporter has held for some years; a somewhat similar view has been well stated by Mr. James Geikie, and Prof. Boyd Dawkins also agrees in it.

Bones beneath the Talus and on the Boulders.

In removing the talus, certain bones were found lying beneath it upon the boulders.

They have, so far as practicable, been determined by Prof. Busk; and he gives the following account of them.

"They are nearly all fragments, but No. 1 is perfect.

"1. Right calcaneum of *Ursus arctos*, 3·4 inches long, 2·2 wide, 1·75 high.

"2. Portion of a young, much worn left calcaneum of *Ursus*, with anterior and posterior epiphyses detached.

"3–67. Small chips and fragments, mostly apparently of the shafts of long bones and ribs of ruminants. Doubtfully referred to Ox? Deer? Goat? or Sheep?

"68. Fragment, probably Elephant.

"69. Fragment of a large Deer-bone.

"70. Fragment of long bone of large bird, probably Swan.

"72. Sesamoid bone of ——?

"77. Fragment of vertebra, perhaps of Bear."

It is an interesting point, if we could make it out, what is the age of these bones. Are they the remains of animals who died upon the moraine rubbish before the talus was of sufficient thickness to form a recognizable bed, or are they bones washed out of the edges of the older cave-earth then exposed above the boulders? The bone doubtfully referred to Wild Swan would seem to point to a rigorous or temperate* climate. The bone doubtfully referred

* I have heard of three instances of Wild Swans having been shot in the immediate neighbourhood. C. Leigh, in his 'Nat. Hist. of Lancashire' &c., published in 1700, says "Swans are common in these parts, but more particularly on the sea-coasts" (p. 141).

to Elephant does not give very strong indications. There seems a possibility of its having been washed out of the lower cave-earth, which contains Elephant-remains.

Most probably both of these sources contributed to this deposit of bones; but that the greater part of them are washed out of the lower cave-earth seems likely, for this reason—that not any fragments of bone were found through the 19 feet of talus which lies between the Neolithic layer and the top of the boulders.

Work in Chamber D. New Galleries.—Besides the work which has been done towards unfolding the glacial evidence at the mouth of the cave, a considerable amount of work has been done in excavating chamber D, and we have the result in a magnificent series of bones. Chamber D will be remembered by those who made a thorough visit to the cave, and explored all its narrowest recesses, as a very low chamber to the right of the principal entrance, filled nearly up to the roof with soft wet mud. It was so low over a greater part of its extent that progression could not be effected on hands and knees, and a serpent-like movement through pools of water lying on soft mud was the only way in which it could be visited. Chamber D now presents a very different aspect. So extensive have been the workings there, that at the entrance the ceiling is now 20 feet above one's head, and it gradually declines towards the inner extremity to a height of 4 or 5 feet. It is about 20 feet wide and 110 feet long; and two galleries have been discovered leading off from it on the right. One is blocked at the entrance with thick beds of stalagmite and fallen blocks of limestone, and has not been explored hitherto. The other leads down at Parallel 44 into a chamber 44 feet long with a N.E. direction, at a tolerably rapid gradient of about 1 in 4·5. At the end of this is a narrow squeeze which admits your Reporter for a short distance only. The forbidden ground beyond has been visited by Mr. John Birkbeck, Jun.; and he reports that this pipe-like cavity proceeds a short distance further and crosses a narrow chasm about 20 feet deep, down which he descended; but further progress proved impracticable.

This gallery we propose to call the Birkbeck Gallery, in acknowledgment of the energetic and valuable assistance of Messrs. John Birkbeck, Sen. and Jun., to the cave exploration from its commencement in 1870.

The Remains found in Chamber D.—The Committee is much indebted to Prof. Busk for his kindness in determining the bones found.

Before being submitted to him they have been all marked with register numbers* in the form of a fraction, the numerator (in this case 1) standing for the year (1874), and the denominator for the no. of the "find" in the year thus, $\frac{1}{1}$, $\frac{1}{2}$, $\frac{1}{3}$, &c. For 1875 the numerator is 2, and for 1876 it will be 3 if the explorations continue, and so on. As records are kept of what portion of the cave is explored in each year, this system will facilitate the reference of any particular bone to its position in the cave. In the past year the bones have also been marked with notes of their position. Thus the large skull of the Grisly Bear $\frac{1}{21^3}$ is marked "P 37, L 4·0, D 4·0," which means that it was found in the 2 feet Parallel 37, at a distance of 4 feet *left* of the wall of the chamber, and at a depth of 4 feet from the surface.

The note-book in which Prof. Busk's determination of the bones is written will be preserved in the Giggleswick Museum for reference.

His summary of the bones found in chamber D is as follows:—

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* This and other valuable services have been carefully carried out for the Committee by Mr. Jackson, the Superintendent.

"Out of about 269 specimens, including detached teeth,

127	belonged to	Bear,	
37	,,	Hyæna,	
36	,,	Bos,	
24	,,	Fox,	
22	,,	Deer	15 Red Deer, 7 Reindeer,
10	,,	Rhinoceros,	
2	,,	Horse,	
1	,,	Badger."	

To these we may add 1 of Pig, 2 of Elephant, and 1 of Hippopotamus.

The Elephant-remains consist of two small right and left lower antepenultimate milk-molars of *Elephas antiquus*, determined by Prof. Leith Adams. A fragment of the tusk of a Hippopotamus, about 2 inches long, is a discovery of the year, being the first relic of Hippopotamus found throughout the explorations. It was in Parallel 32, at a depth of 7 feet. Close by it was the carnassial tooth of a Hyæna, which perhaps may account for its having been found at such a distance from the river, now flowing about 1000 feet below.

It may be well here to correct an error as to the identification of remains of which a list occurs in Mr. Denny's paper "On the Geological and Archæological Contents of the Victoria and Dowkabottom Caves in Craven," Proc. Geol. and Polytechnic Soc. of the West Riding, 1859. At the head of the list of animals found is the following entry:—

"Cave Tiger (*Felis spelæa*). A canine tooth recognized by the late Dr. Buckland, and now in the British Museum.—Victoria Cave."

Inasmuch as in the course of six years' diggings no remains of Tiger or Lion had been recognized by the Committee, Mr. William Davies, of the British Museum, was communicated with; and he kindly returned an answer that he had examined the remains in the British Museum, that it was a case as surmised, of erroneous identification, and that the tooth in question was the canine of a Bear.

The existence of the Cave-Lion in the Victoria Cave remains therefore to be proved.

Prof. Busk remarks of the bones and teeth submitted to him:—"They are a remarkably interesting collection, especially in the Bears; and I think the larger of the two skulls is by far the finest specimen of the kind yet found in this country."

Many interesting facts come out from the systematic record of the position of the bones. The appended Table (p. 174) of instances of bones which appear to belong to the same individual, but which have been found apart from one another, is an interesting commentary upon the way in which bones become scattered through a cave whether by the intentional transportation by beasts of prey in the process of devouring, or by the shuffling tread of the same beasts amongst the loose bones lying on the floor.

This leads us to the fact that many of the bones have a very fine polish and it seems probable that the cause of this is that suggested by Dr. Buckland*, the treading of the beasts upon them; the fine mud occurring in the cave would make a very good polishing-paste, and being of a very plastic nature, would tend afterwards, when accumulating in sufficient quantity, to cover up the bones and preserve that polish. It occurs on the long bones of both ruminants and Bears, and not only on one side as noticed by Dr. Buckland, but all round. The specimens noticed are all apparently in the upper

* Reliquiæ Diluvianæ, p. 31.

ɔed, to be hereafter mentioned. One of the polished long bones of an Ox ıas a crust of stalagmite upon it, and the polish runs up to and under it.

The greatest distance to which we have traced separate bones of the same ndividual is 44 feet in the case of the right calcaneum and right astragalus ɔf a Hyæna; they occurred at the depths of 10 and 6 feet respectively.

Another interesting case is that of a magnificent pair of Reindeer-antlers, which were in four portions scattered over a distance of 32 feet. Moreover, ınd this is an instructive fact, the several portions were in different states of ɔreservation, yet could be fitted together without any difficulty. This we ıhould do well to remember when inclined to speculate on the relative age of ɔones from their state of preservation.

Again, the two fibulæ of Bear, probably belonging to the same individual, ɔeing a right and left, and having each a tumour of the bone in the same ɔosition on the shaft, remind us that bears may have sources of discomfort ɹuite apart from the "res angusta domi." Two fearfully swollen and dis-ɔorted metatarsals of the same animal ($\frac{1}{4}\frac{1}{9}$* and $\frac{1}{5}\frac{1}{0}$*) tell the same tale. On ɦe other hand, two large tusks of the Grisly Bear ($\frac{1}{6}\frac{1}{7}$ and $\frac{1}{6}\frac{1}{8}$), worn down ılmost to their sockets, would seem to indicate a healthy life extending to a ɣood old age.

Your Reporter has carefully reduced from the data in the register a synop-ıical section, showing the occurrence of each animal in the different parallels ınd the depth at which they occur. The result is a Table too bulky for pub-ication, but its substance may be briefly given in words.

The bones appear to group themselves chiefly along two horizons, which ıre separated from one another by a greater or less thickness of cave-earth, ıaminated clay, and stalagmite.

The lower extends from the back of the boulder-beds before the cave ɲouth, is continuous with that which contained the human fibula, and runs ılmost continuously as far as P 42, and possibly further. The upper bed com-ɲences only at P 15, and extends to about P 43. Where the upper bed com-ɲences, the two horizons are about 12 feet from one another; but the lower ɾises quickly towards P 23, then continues horizontally at a depth of about 5 ɟeet below the upper bed as far as P 35. At this point it rises still more, and ɦe two beds not only touch each other, but seem to be somewhat intermingled.

The following Table shows the species occurring in the two beds in ɔhamber D:—

	Man.	Hyæna.	Fox.	Grisly Bear.	Brown Bear.	Badger.	*Elephas antiquus.*	Horse.	*Rhinoceros leptorhinus.*	Hippopotamus.	Pig.	Red Deer.	Reindeer.	*Bos primigenius.*	Goat or Sheep.
Upper Bed	*	..	*	*	..	*	....	*	...	....	*	*	*	?	*
Lower Bed	*	*	*	*	*	..	*	..	*	*	..	*	..	*	

Peculiar to Upper Bed.	Peculiar to Lower Bed.	Common to both.
Badger.	Hyæna.	Man.
Horse.	Brown Bear?	Fox.
Pig.	*Elephas antiquus.*	Grisly Bear.
Reindeer.	*Rhinoceros leptorhinus.*	Red Deer.
Goat or Sheep?	Hippopotamus.	
	Bos primigenius?	

Of course further work may much alter these lists.

The upper bed probably contains remains from the Reindeer period to the present, those of later date being mixed up with the older in the mud at the surface. But as distinguished from the lower bed, the chief characteristics of the upper appear to be the presence of Reindeer, and the absence of Elephant, Rhinoceros, Hippopotamus, and Hyæna. It is true that by the register there appears to be one specimen (a molar tooth) of Reindeer in the lower bed. It is marked P 35, and as at a depth of 8 feet, which would place it in the lower bed. It seems that this may be possibly a clerical error, and that 8 inches would be the proper reading. The mere placing the stop before or after the numeral would make the difference; moreover there are Reindeer-remains in the same parallel at a depth of 1 foot, and in the next parallel at a depth of 8 *inches*. If it was really found at a depth of 8 feet, it is a solitary instance of Reindeer in the lower bed, whereas in the upper it is common.

Of Hyæna, *very* common in the lower bed, there appears at first sight to be one specimen (a humerus) in the upper; but on examination this is not quite so certain. It occurs in Parallel 37 at a depth of 2 feet, where the two beds run together. This alone ought to put us on our guard. But strangely enough it is at 2 feet higher elevation in the same parallel than the great skull of Grisly Bear, which is proved by the situation of its lower jaw on the surface to belong to the upper bed. It did not lie, however, immediately above the Bear's skull, but 2 feet east of it; so that it seems quite possible that the apparent superposition may be only due to the unevenness of the floor at the time when the Bear's skull came into position.

It is also highly improbable that had the Hyæna lived at the same time as this great Bear, he would have left so fine a skull intact for the Committee to exhume.

These facts are of great interest and importance, as warning us against the danger of assuming from the juxtaposition of objects their contemporaneity in all cases. In this case we have a fauna which we may confidently assign to a cold climate, separated in some parts by an accumulation of deposits *twelve feet in thickness* from an earlier one, which is equally characteristic of high temperatures; whereas in another part of the cave not far off, where the material to separate them is wanting, we have animals from icy and tropical countries intermingled in a confusion which would be puzzling did we not get the clue hard by. It is evident that here the separation is natural and regular; the mixture is abnormal and accidental.

It is probable that Brown Bear occurs in both the beds; there are many Bear-remains in both; but they do not, in most cases, admit of specific determination. Brown Bear has been found before in the higher beds in other parts of the cave.

Rhinoceros leptorhinus has not been found before in the cave, but its presence is well established now by teeth and bones*. It is interesting to note that it is as usual accompanied by *Elephas antiquus*. Hippopotamus, as already stated, has been found this year for the first time.

In the upper bed, the only sign of man's presence consists of the spinous process of a bear's vertebra, which has been hacked, apparently by some cutting instrument with a tolerably regular edge. It might have been done with a bronze celt or a polished flint axe. It is probable that chamber was never the resort of man within the historic period. The soft wet mud of the floor and the lowness of the roof render it most unlikely that any one would take to it, except under the direst necessity or in the pursuit of science.

* P.S. It would appear that the remains occurring in the Cave, formerly attributed *R. tichorhinus*, really belong to this species.

In the lower bed, again, evidence of man's presence is but scanty. At the mouth, and close to where the human fibula was found, we have this year met with a piece of rib ($\frac{2}{3}\frac{3}{5}$) apparently nicked by human agency. It is about $2\frac{1}{2}$ inches of the dorsal end, but the articulating surfaces are broken off. There are nine transverse nicks not reaching quite across, some not halfway, and also a longitudinal nick. They appear to have been made by some clumsy instrument drawn backwards and forwards. In character they are totally unlike the square troughed hollows made by the gnawing of rodents; and they are equally unlike the furrows heavily ploughed by the teeth of Carnivores. This specimen was at a depth of 25 feet from the roof of the cave, which at this point was filled to the ceiling. We cannot at present say of what animal it is a rib. Some light may perhaps be thrown on it by a careful comparison. This is immaterial compared to the main fact, which is, that there is much difficulty in supposing it to have been nicked by any agency other than human.

Conclusion.—And now, having restricted ourselves almost entirely to the hard road of fact, in conclusion we may perhaps be permitted to indulge in a short flight of fancy. Let us endeavour to realize how great is the distance in time which separates the savage of Craven from our own day. We have the history of much of it in the Victoria Cave itself, and we may restore some of the missing pages from the surrounding district. At the Cave, Roman times are separated from our own by sometimes less than one, but not by more than two feet of talus, the chips which time detaches from the cliffs above. The Neolithic age, which antiquaries know was a considerable time before the Roman occupation, is represented by a layer in some places 4 or 5 feet beneath the Roman, in others running into it. Then comes a thickness of 19 *feet* of talus without a record of any living thing. Judging by the shallowness of the Roman layer, this must represent an enormous interval of time. And this takes us down to the boulders, the inscribed records of the Glacial Period. They must represent a long series of climatal changes, during which the ice was waxing and waning, advancing and melting back over the mouth of the Victoria Cave. This period saw the Reindeer and the Grisly Bear occasionally in possession. Then we have an unconformity, a break in the continuity of the deposits, the boulders lying on the edges of the older beds—Time again! And that time was long enough for changes to take place which allowed the district to cool down from a warmth suitable to the Hippopotamus and become a fitting pasture-ground for the Reindeer. It was in that warm period that the Craven savage lived and died.

But these are not all the changes which occurred in the north of England since that time. The age of the great submergence represented by the sea-beaches of Moel Tryfaen and Macclesfield, and by the Middle-Sands-and-Gravels of Lancashire, has left no record up at the cave. Your Reporter is of opinion that the submergence did not attain in that district a greater depth than six or seven hundred feet; and this would still leave the cave 700 feet above the sea, though it would cut up the land into a group of islands. The fact is sufficient for us, the depth is immaterial. Upon no fact are geologists better agreed than upon the existence of a widespread submergence and emergence of land towards the close of the Glacial Period. No tradition is common to more races or religions than that of a great deluge. Where back in the past is the common point whence these two far-travelled, almost parallel rays of truth had their origin? In the opinion of your Reporter the Craven savage, who lived before the Great Ice-sheet and *before the Great Submergence*, may form another of the many strong ties which bind together the sciences of Geology and Anthropology.

Appendix.

Table of Remains which fit, pair, or otherwise indicate their belonging to the same individual, with the distances at which they were found apart.

Register Number.	2-feet Parallel.	Distance left of right wall of Chamber D.	Depth from surface.	Nature of the Bones.		Extreme distances apart in feet.
1/5	18	12·0	1·6	Radius of large Fox	correspond?	12
1/17	24	16·4	2·0	Femur „ „		
1/20	26	9·2	5·3	Atlas of Bear	fit.....	22
1/213	37	4·0	4·0	Skull of large Grisly Bear		
1/41	33	2·0	·10	†Right ramus of mandible of ditto		
1/24	27	10·3	2·0	Right scapula, Bear	pair correspond?	6 or 36
1/139	30	·4	·6	Left „ „		
1/258	45	·6	1·3	Pelvis of very large Bear		
1/28	28	12·0	2·0	Left femur of young Bovine	pair	8
1/39	32	17·0	·6	Right „ „		
1/43	36	4·0	7·0	Fibula of Bear with tumour	pair.....	10
1/37	31	1·0	7·0	„ „ „		
1/90*	15	7·0	10·0	Right calcaneum, Hyæna	fit.....	44
1/222*	37	16·0	6·0	Right astragalus, „		
1/94	16	.....	12·0	Right pisiforme of large *Cervus*	pair	12
1/108	22	4·0	9·0	Left „ „		
1/135	28	9·0	7·0	Calcaneum of large Bovine	fit.....	34
1/101	18	7·0	10·0	Left naviculare, *Bos primigenius*		
1/182	35	5·6	8·0	„ astragalus, „		
1/117	24	4·0	9·0	Right ulna, Hyæna	pair	3
1/118	24	7·0	9·0	Radius, „		
1/132	27	3·0	1·0	Different portions of a magnificent pair of Reindeer-antlers	.....	32
1/205	36	2·0	·8			
1/242	14	1·0	1·8			
1/256	3	1·0	1·0			
1/192	35	9·0	5·0	Right os magnum of Red Deer	fit.....	5
1/194	35	4·0	5·0	„ unciforme „		
1/199	35	·6	·6	Left lower jaw, Fox	fit.....	16
1/253	43	1·3	1·6	Right „ „		
1/9	20	13·0	2·0	Left scapho-lunar, Bear	fit.....	32
1/212	36	3·0	5·0	„ os magnum, „		

† The left ramus was already in the Giggleswick Museum, and had been found in another part of the Cave.

EXPLANATION OF THE PLATES.

Plate V.

Victoria Cave, No. 1. This gives a general view of the Cave and the cliffs above. Above the workmen is a cave boarded up and used as a tool-house. To the right of that is a niche in the Cliff, the old entrance to the Cave first discovered by Mr. Jackson. The present entrance, before the excavations, was completely covered up with screes. Mr. Jackson, the figure on the right, is sitting close to the arched niches mentioned at p. 167. The flat in the fore ground is not a natural feature, but produced by the levelling of the tip and talus. The bottom of the valley is at a far lower level. A level cutting through the flat is seen going from the left-hand lower corner up to the boulders.

Plate VI.

Victoria Cave, No. 2, gives a nearer view of the boulders near the entrance, of the rock-pinnacles forming the floor, and of the arched niches described at p. 167. The human relics were found near the crowbar, which is seen in the background beyond the workmen, but at a lower level. Mr. Jackson is standing between the boulders and the talus, and the marked difference between the two deposits is well seen. The boulders before being photographed were marked S for Silurian, L for Carboniferous Limestone, and G for Carboniferous Gritstone. The marks C^{on} and S^{tl} should have been C^{te} and S^{te} for Conglomerate and Stalactite, and denote respectively a piece of the conglomerate from the base of the Carboniferous Limestone, and two large pieces of Stalactite, which have apparently fallen on the boulders from the roof of the Cave before it had been worn as far back as it now is.

THE VICTORIA CAVE, SETTLE, N°I.

THE VICTORIA CAVE, SETTLE; N°II.

SETTLE CAVE-EXPLORATION.

(VICTORIA CAVE.)

A COMMITTEE, consisting of Sir J. P. Kay Shuttleworth, Bart., (Chairman,) Sir John Lubbock, Bart., Mr. John Evans, Col. Lane Fox, Professors Busk, Dawkins, Hughes, Miall, and Prestwich, and Messrs. J. Birkbeck, sen., James Farrer, Walter Morrison, Rev. W. H. Crosskey, and others, are engaged in the above exploration. The results already achieved are before the public in the Reports of the British Association, in Professor Boyd-Dawkins's work on "Cave Hunting," and in other works.

The great interest of the Victoria Cave lies in the long succession of events represented by its contents, which are of the greatest importance to the historian, the antiquary, and the geologist. The fine collections made here and deposited in the Museum of Giggleswick School illustrate the occupation of the country, and of the cave at intervals, by the early English, Roman, and Celtic populations. Then further back by many ages are found the remains of people who used the newer type of stone implements.

In beds of earlier age we have evidence of the occupation of Yorkshire by the reindeer and the grizzly bear in times immediately succeeding and probably preceding the development of the Great Ice-sheet in the North of England.

Still further back we are enabled to decipher the record of a remotely distant age when man was living on the same ground with the great cave-bear, the hyæna, elephant, rhinoceros, hippopotamus and bison.

The cave is unique in possessing data showing the existence of man in the North of England *before* those cold conditions came on which covered the Northern Counties with a thick mantle of ice.

The Committee are now working in beds of still earlier age and hope by perseverance to throw some light upon the condition of Britain and its inhabitants during some of the most obscure ages of its Geological history, the interest and value of the explorations increasing as the work is carried down into lower and earlier beds. Except at the entrance the rocky floor of the Cavern has not yet been found, and it is impossible to say what treasures to Science, and aids to the unwritten history of man, still lie beneath the feet of the explorers.

Though liberally assisted by a grant from the British Association the Committee find themselves obliged to appeal to the public for further funds, without which this interesting work will speedily come to a premature end.

(*Signed,*) JOHN BIRKBECK, Jun., *General Secretary and Treasurer.*

R. H. TIDDEMAN, *Secretary to the British Association Committee.*

March, 1877.

Statement of Account from 1st July, 1873, to the end of 1876.

SECOND HALF-YEAR, 1873.

	£ s. d.		£ s. d.
To Wages ...	21 5 8	By Subscriptions ...	165 13 0
,, Balance ...	144 7 4		
	£165 13 0		£165 13 0

FIRST HALF-YEAR, 1874.

To Wages ...	101 14 8	By Balance ...	144 7 4
,, Printing, Tools, Powder, Candles, &c. ...	6 12 3	,, Subscriptions ...	27 2 0
,, Balance ...	113 2 5	,, British Association Grant*	50 0 0
	£221 9 4		£221 9 4

SECOND HALF-YEAR, 1874.

To Wages ...	112 1 1	By Balance ...	113 2 5
,, Printing, Tools, Powder, Candles, &c. ...	4 5 10	,, Subscriptions ...	5 4 6
,, Balance ...	52 0 0	,, British Association Grant ...	50 0 0
	£168 6 11		£168 6 11

FIRST HALF-YEAR, 1875.

To Wages ...	69 5 10	By Balance ...	52 0 0
,, Printing, Tools, Powder, Candles, &c. ...	5 2 10	,, Subscriptions ...	83 6 0
,, Balance ...	60 17 4		
	£135 6 0		£135 6 0

SECOND HALF-YEAR, 1875.

To Wages ...	95 5 1	By Balance ...	60 17 4
,, A large box ...	2 8 9	,, Subscriptions ...	53 12 6
,, Printing, Tools, Powder, Candles, &c. ...	4 1 8		
,, Balance ...	10 14 4		
	£114 9 10		£114 9 10

FIRST HALF-YEAR, 1876.

To Wages ...	83 13 0	By Balance ...	10 14 4
,, Printing, Tools, Powder, Candles, &c. ...	3 10 6	,, Subscriptions ...	10 10 0
,,Compensation to tenant for disturbance ...	0 15 0	,, British Association Grant ...	100 0 0
,, Balance ...	33 5 10		
	£121 4 4		£121 4 4

SECOND HALF-YEAR, 1876.

To Wages ...	86 17 4	By Balance ...	33 5 10
,, Printing. Tools, Powder. Candles, &c. ...	2 17 7	,, Subscriptions ...	31 1 0
,, Balance ...	74 11 11	,, British Association Grant	100 0 0
	£164 6 10		£164 6 10

* *The British Association Grants are credited in the half-years in which they were received by the Local Secretary.*

LIST OF SUBSCRIPTIONS

Received and expended from April, 1875,

to end of February 1877.

	£	s.	d.
John Birkbeck, jun., Esq.	1	0	0
John Hargraves, Esq.	1	1	0
Henry Brown, Esq.	2	2	0
Edward Wood, Esq.	1	1	0
Thos F Gibson, Esq.	2	2	0
J. E. H Peyton, Esq.	2	0	0
John R Ford, Esq,	5	0	0
Chas. Darwin, Esq.	5	0	0
J. Evans, Esq.	5	0	0
John E. Lee, Esq.	2	2	0
W. E. Forster, Esq., M.P.	2	0	0
R. Assheton, Esq., M.P.	2	2	0
Thomas E. Yorke, Esq.	1	0	0
The Duke of Devonshire	20	0	0
Charles Ricketts, Esq.	0	10	0
Professor Prestwich	2	2	0
Daniel Moore, Esq., M.D.	0	10	6
C. Lloyd Morgan, jr., Esq	0	10	6
Thos. Howitt, Esq.	1	0	0
Lord de Clifford	2	0	0
Rev. J. Stansfeld	2	2	0
Capt. J Stansfeld	1	0	0
Thos. M. Rickman, Esq.	2	2	0
Jas. W Davis, Esq.	2	2	0
Wm Stott, Esq	1	1	0
Wm. Fison, Esq.	5	0	0
Wm. Aldam, Esq.	1	0	0
F. S. Powell, Esq.	5	0	0
John Paley, Esq	5	0	0
Rev. Maxwell Close	2	0	0
Chas H. L. Woodd, Esq.	2	2	0
J. E. Lee, Esq.	3	3	0
E. H Wade, Esq.	1	1	0
Jas. Law, Esq.	1	1	0
John Brigg, Esq.	1	1	0
J. J. Ikin, Esq.	1	0	0
T. Wilson, Esq.	1	0	0
R. Reynolds, Esq	1	0	0
James Eccles, Esq.	10	0	0
Professor Busk	3	3	0
C. Deighton, Esq., M.D.	1	1	0
John Ashton, Esq.	0	10	0
W. Baily, Esq.	1	0	0
L. C Miall, Esq	1	0	0
An Officer's daughter	0	10	6
Charles Semon, Esq.	1	1	0
George Knowles, Esq.	1	1	0
M. Bottomley, Esq.	1	1	0
F. W Fison, Esq.	1	1	0
J. M Barwick, Esq.	1	1	0
H. Milligan, Esq.	0	10	6
H. Muller, Esq.	0	10	6
H F. Killick, Esq.	0	10	6
J. McLandsborough, Esq. Dobie, Esq., M.D.	1	1	0
	1	1	0
J. S Bacchus, Esq.	1	1	0
Jas. S. Taylor, Esq.	1	1	0
Robert Aked, Esq.	0	10	6
S. Watmough, Esq.	1	1	0
Walter Scott, Esq.	1	1	0
S. Milne Smith, Esq	1	1	0
S. Moore, Esq.	5	0	0
Wm. Robinson, Esq	2	0	0
Joseph J. Gleave, Esq.	2	2	0
Henry Brown, Esq.	2	2	0
J D. Milne, Esq.	1	1	0
J. P. Brown, Esq.	1	1	0
R H. Sidgwick, Esq.	1	1	0
J. B. Dewhurst, Esq.	1	1	0
J. H. Dewhurst, Esq.	1	1	0
George Robinson, Esq.	1	1	0
John Birkbeck, Esq.	10	10	0
John Birkbeck, jun., Esq	5	5	0
A Visitor	0	5	0
C. Lloyd Morgan, jr., Esq.	0	10	6
James Eccles, Esq.	5	0	0
T. K Callard, Esq.	1	0	0
W. M Watts, Esq.	5	0	0
Miss Sutcliffe	1	0	0
Miss Preston	1	0	0
Miss Jarry	0	10	6
Miss Tristram	1	0	0
Bradford Scientific Association	4	11	0

☞ Subscriptions may be forwarded to JOHN BIRKBECK, Jun., Esq., Honorary Treasurer of the "Settle Cave-Exploration Fund," at the Craven Bank, Settle, Yorkshire.

Settle Cave-Exploration.